

Summary of FRN Solicitation for Public Comment

Description of Comments		In Agreement	Against
Adequacy of Technical Basis for Revising 50.46(b)			
1	In place of <u>or</u> in addition to PQD, regulatory criteria which ensure the structural integrity of the entire fuel rod need to be developed. Integral LOCA testing is required along with a better understanding of LOCA loads. Constrained quench testing or impact (fracture toughness) testing may be alternatives.	IRSN JAEA ¹ GRS ²	
2	Additional PQD testing required at mid-level hydrogen concentrations. Sparse experimental database does not support linear relationship or zero threshold at 800 ppm.	IRSN NEI GNF Westinghouse	
3	Highly corroded fuel rods with high burnup will never achieve 2200 °F PCT limit during a postulated LOCA. As a result, PQD test results are overly conservative. PQD tests on high burnup (high hydrogen content) fuel segments should target a lower, more realistic test temperature.	Westinghouse NEI	
4	Fuel rod balloon / burst region requires further experimental research. Integral tests on rod bundles may be required.	IRSN JAEA GRS	
5	Testing with mid-burnup irradiated fuel segments needed to determine transition from single-sided to double-sided oxidation. Planned integral PWR fuel rod tests are needed to investigate ID oxidation.	Westinghouse NEI	
6	ANL test results inconsistent with other research programs.	GNF Westinghouse NEI	
7	Ring compression testing is either non-prototypical of applied loads or overly conservative with respect to determining post-quench ductility.	JAEA Westinghouse	
8	PQD test results are insensitive to alloy composition. As such, results are applicable to all future zirconium alloys.	NEI GNF	IRSN Westinghouse
9	Fuel fragmentation, axial relocation, and dispersal need to be addressed in the revised rule.	IRSN	
10	High pressure steam oxidation tests required to better represent SBLOCA conditions.	IRSN	
11	Need to investigate the effect of varying heating/cooling rates on PQD.	GNF NEI	
12	Weak technical justification for additional breakaway oxidation requirement.	GNF	
13	Breakaway oxidation tests performed under isothermal conditions may not be representative of LOCA transient temperature history.		

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Description of Comments		In Agreement	Against
Performance Based Testing Requirements			
1	Periodic testing is unnecessary since trace elements and manufacturing variability will not influence LOCA performance.	GNF NEI Westinghouse	IRSN
2	Repeatability of test results (e.g., breakaway oxidation) bring into question periodic testing requirements.	Westinghouse	
3	Need to develop a better understanding of the influence of sample preparation and test conditions on the results of the experiments. Need to develop standardized test procedures.	GNF Westinghouse NEI	
4	Un-irradiated, hydrogen charged cladding is an appropriate surrogate for irradiated cladding.	IRSN NEI Westinghouse GNF	
Implementation of Revised 50.46(b)			
1	NUREG-0630 should be revised to capture more recent experimental results.	IRSN	
2	Need to coordinate 50.46(b) revision with ongoing rulemaking associated with transition break size (50.46(a)).	IRSN	
3	Question need to model double-sided oxidation away from burst node. For example, Limerick rod did not exhibit ID alpha-layer following test even though fuel bonding was present.	GNF NEI JAEA Westinghouse	
4	Influence of CRUD should be understood and accounted for in LOCA analyses.	Public (2)	NEI
5	Implementing hydrogen-based regulations will require expensive hot-cell examinations and updates to corrosion/hydrogen models.	GNF	
6	Benefit to public health and safety not sufficient to justify the expected cost to implement the new rule.	Westinghouse	
7	No safety reason to rush into rulemaking (wait until a more adequate technical basis exists).	NEI Westinghouse	